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Attorneys for Plaintiff PUREPREDICTIVE, INC.

**UNITED STATES DISTRICT COURT OF CALIFORNIA**  
**FOR THE NORTHERN DISTRICT OF CALIFORNIA**

PUREPREDICTIVE, INC, a Utah corporation

Plaintiff,

v.

H2O.AI, Inc., a Delaware corporation

Defendant.

CASE NO.

**COMPLAINT FOR PATENT  
INFRINGEMENT**

**DEMAND FOR JURY TRIAL**

Plaintiff PUREPREDICTIVE, Inc. ("PPI") hereby complains of Defendant H2O.AI, Inc. ("H2O") and DOES I through X, inclusive, and alleges as follows:

**PARTIES**

1. Plaintiff PPI is a Utah corporation with its principal place of business in Utah.
2. On information and belief, H2O is a Delaware corporation with its principal place of business in Santa Clara County, California.
3. PPI is ignorant of the true names and capacities of Defendants sued herein as DOES I through X inclusive ("DOE Defendants"), and therefore sues the DOE Defendants by such fictitious names. PPI will amend this Complaint to allege their true names and capacities when ascertained. PPI is informed and believes and thereon alleges that each of the DOE

1 Defendants is responsible in some manner for the occurrences herein alleged, and that PPI's  
2 losses and damages as herein alleged were proximately caused by the misconduct of the DOE  
3 Defendants.

4 **JURISDICTION AND VENUE**

5 4. This is an action for patent infringement. This Court has subject matter  
6 jurisdiction under 28 U.S.C. § 1331 as the patent infringement claim arises under the patent  
7 laws of the United States, 35 U.S.C. § 271 *et seq.*

8 5. This Court has personal jurisdiction over H2O because H2O has continuous and  
9 systematic contacts with the State of California and does business in this District. For example,  
10 H2O maintains operations in Mountain View, California.

11 6. Venue is proper in this District under 28 U.S.C. § 1391 because i) H2O resides  
12 in this judicial district and, ii) on information and belief, H2O's acts of infringement took place  
13 and are taking place within this jurisdiction.

14 **FACTUAL BACKGROUND**

15 7. PPI is a technology-backed service company using artificial intelligence to  
16 orchestrate advanced predictive modeling exponentially increasing the insights that businesses  
17 gain from their data.

18 8. Through patented technology, PPI dramatically streamlines the process to  
19 model and deploy advanced predictive models allowing businesses to transform their data  
20 warehouses into repositories of revenue.

21 9. H2O is an open-source software service company that provides a machine  
22 learning platform that is integrated with applications and data products, and customer support  
23 offerings for the machine learning platform.

24 **The Patent-in-Suit**

25 10. PPI is the owner and assignee of several patents and pending patent applications  
26 relating to U.S. Patent No. 8,880,446.

27 11. On November 4, 2014, the United States Patent and Trademark Office duly and  
28 legally issued U.S. Patent No. 8,880,446 ("the '446 Patent"), entitled "PREDICTIVE

1 ANALYTICS FACTORY” to Richard W. Wellman and Kelly D. Phillipps. PPI is the owner of  
2 the ’446 Patent. A true and correct copy of the ’446 Patent is attached hereto as Exhibit A.

3 12. The ’446 Patent is valid and enforceable.

4 13. PPI provides services that use artificial intelligence to orchestrate advanced  
5 predictive modeling in accordance with the principles described in the ’446 Patent.

6 14. On May 24, 2017, PPI’s representatives contacted H2O to inform it of the ’446  
7 Patent and PPI’s belief that H2O’s machine learning platform uses one or more apparatuses,  
8 methods, program products, and systems covered by the ’446 Patent.

9 **Infringement of the Patent-in-Suit**

10 15. On information and belief, H2O’s development and distribution of its artificial  
11 intelligence platform (“H2O with AutoML”) infringes one or more claims of the ’446 Patent.

12 16. Independent claim 1 of the ’446 Patent is a representative claim of an apparatus  
13 infringed by H2O with AutoML. Claim 1 recites the following elements:

14  
15 An apparatus for a predictive analytics factory, the apparatus comprising:

16 a receiver module configured to receive training data for forming a predictive  
17 ensemble customized for the training data;

18 a function generator module configured to pseudo-randomly generate a plurality  
19 of learned functions based on the training data without prior knowledge  
20 regarding suitability of the generated learned functions for the training  
21 data;

22 a function evaluator module configured to perform an evaluation of the plurality  
23 of learned functions using test data and to maintain evaluation metadata  
24 for the plurality of learned functions, the evaluation metadata  
25 comprising one or more of an indicator of a training data set used to  
26 generate a learned function and an indicator of one or more decisions  
27 made by a learned function during the evaluation; and  
28

1 a predictive compiler module configured to form the predictive ensemble, the  
2 predictive ensemble comprising a subset of multiple learned functions  
3 from the plurality of learned functions, the multiple learned functions  
4 selected and combined based on the evaluation metadata for the plurality  
5 of learned functions, the predictive ensemble comprising a rule set  
6 synthesized from the evaluation metadata to direct data through the  
7 multiple learned functions such that different learned functions of the  
8 ensemble process different subsets of the data based on the evaluation  
9 metadata.

10 17. Independent claim 14 of the '446 Patent is a representative claim of method  
11 infringed by H2O with AutoML. Claim 14 recites the following elements:

12  
13 A method for a predictive analysis factory, the method comprising:

14 pseudo-randomly generating a plurality of learned functions based on training  
15 data without prior knowledge regarding suitability of the generated  
16 learned functions for the training data, the training data received for  
17 forming a predictive ensemble customized for the training data;

18 evaluating the plurality of learned functions using test data to generate  
19 evaluation metadata indicating an effectiveness of different learned  
20 functions at making predictions based on different subsets of the test  
21 data; and

22 forming the predictive ensemble comprising a subset of multiple learned  
23 functions from the plurality of learned functions, the subset of multiple  
24 learned functions selected and combined based on the evaluation  
25 metadata, the predictive ensemble comprising a rule set synthesized  
26 from the evaluation metadata to direct different subsets of the workload  
27 data through different learned functions of the multiple learned functions  
28 based on the evaluation metadata.

1           18.     Independent claim 17 of the '446 Patent is a representative claim of a computer  
2 program product infringed by H2O with AutoML. Claim 17 recites the following elements:

3  
4           A computer program product comprising a non-transitory computer readable storage  
5 medium storing computer usable program code executable to perform operations for a  
6 predictive analysis factory, the operations comprising:

7                   pseudo-randomly determining a plurality of learned functions using training  
8                   data without prior knowledge regarding suitability of the determined  
9                   learned functions for the training data, the training data comprising a  
10                  plurality of features, the training data received for forming a predictive  
11                  ensemble customized for the training data;

12                  selecting a subset of the features of the training data based on evaluation  
13                  metadata generated for the plurality of learned functions, the evaluation  
14                  metadata comprising an effectiveness metric for a learned function; and

15                  forming the predictive ensemble, the predictive ensemble comprising at least  
16                  two learned functions from the plurality of learned functions, the at least  
17                  two learned functions using the selected subset of features, the at least  
18                  two learned functions selected and combined based on the evaluation  
19                  metadata, the predictive ensemble comprising a rule set synthesized  
20                  from the evaluation metadata to direct data through the at least two  
21                  learned functions so that different learned functions process different  
22                  features of the selected subset of features.

23           19.     Independent claim 23 of the '446 Patent is a representative claim of a predictive  
24 analytics ensemble infringed by H2O with AutoML. Claim 23 recites the following elements:

25  
26           A predictive analytics ensemble comprising:

27                   multiple learned functions synthesized from a larger plurality of learned  
28                   functions, the multiple learned functions selected and combined based

1 on evaluation metadata for an evaluation of the larger plurality of  
2 learned functions, wherein the larger plurality of learned functions are  
3 generated pseudo-randomly from training data without prior knowledge  
4 of a suitability of the larger plurality of learned functions for the training  
5 data;

6 a metadata rule set synthesized from the evaluation metadata for the plurality of  
7 learned functions for directing data through different learned functions  
8 of the multiple learned functions to produce a result; and

9 an orchestration module configured to direct the data through the different  
10 learned functions of the multiple learned functions based on the  
11 synthesized metadata rule set to produce the result.

12 20. On information and belief, H2O with AutoML infringes Claims 1, 14, 17, and  
13 23 of the '446 Patent.

14 21. H2O with AutoML is open source, and therefore the source code for the H2O  
15 platform is publicly available from H2O's website via the GitHub version control repository.

16 22. H2O's website also includes links to documentation for H2O with AutoML  
17 ("the documentation") including source code documentation, tutorials, videos, examples, and  
18 presentations that discuss the design and implementation of H2O with AutoML, including how  
19 machine learning ensembles are generated and used.

20 23. The documentation describes how training data is imported or uploaded to H2O  
21 with AutoML.

22 24. The documentation also describes how different machine learning models are  
23 selected and generated based on the training data.

24 25. H2O posted a slideshow ("the slideshow") for AutoML online on October 31,  
25 2016, prepared by Raymond Peck, director of H2O's product engineering, which discloses that  
26 the machine learning models in H2O with AutoML are selected and generated automatically  
27 without determining whether the models are suitable for the training data.

1           26.     H2O also posted a video online (“the video”) on February 24, 2017, where Erin  
2     Ledell, a statistician and machine learning scientist at H2O, discusses how AutoML will  
3     automatically select machine learning models for a stacked machine learning ensemble without  
4     requiring a data scientist to specify parameters, features, etc. for the machine learning models  
5     as a function of the training data.

6           27.     The source code for H2O with AutoML (version 3.02) (“the source code”)   
7     includes a java file (AutoML.java) that includes java source code for automatically generating  
8     a series of different machine learning models without receiving input from a user, such as a  
9     data scientist, regarding parameters or other settings for generating the machine learning  
10    models based on the training data.

11          28.     The documentation also describes how the performance of each of the machine  
12    learning models is evaluated using test data, and how the results of the evaluation of the  
13    machine learning models are stored as metadata associated with the machine learning models.

14          29.     According to the documentation, cross-validation and/or test data is used to  
15    evaluate the performance of the machine learning models.

16          30.     The documentation also describes how a stacked machine learning ensemble  
17    that includes multiple machine learning models is generated using various machine learning  
18    models that were trained and evaluated on the training and testing data.

19          31.     The documentation also describes how machine learning models are selected for  
20    inclusion in the stacked machine learning ensemble based on the evaluation metadata.

21          32.     The slideshow also suggests that a stacked machine learning ensemble is  
22    generated by automatically selecting machine learning models to include in the stacked  
23    machine learning ensemble according to a rating or evaluation metadata associated with each  
24    machine learning ensemble.

25          33.     The source code also includes code for generating a stacked ensemble based on  
26    the machine learning models that are automatically generated without receiving input from a  
27    user.



36. Given H2O's documentation, open source software, slideshow, and issue tracking information, PPI has reason to believe that H2O with AutoML operates using Claims 1, 14, 17, and 23 of the '446 Patent.

(Direct Infringement of U.S. Patent No. 8,880,446)

38. H2O has infringed and continues to infringe, either literally or under the doctrine of equivalents, one or more claims of the '446 Patent by developing and distributing H2O with AutoML. H2O's activities constitute direct infringement under 35 U.S.C. § 271(a). A representative claim chart detailing H2O's infringement of at least independent claims 1, 14, 17, and 23 of the '446 Patent is attached as Exhibit B.

40. PPI has sustained damages as a direct and proximate result of H2O's infringement of the '446 Patent.



(Induced Infringement of U.S. Patent No. 8,880,446)

42. PPI repeats and incorporates by reference the allegations in paragraphs 1-41 of the Complaint as if fully set forth herein.

43. H2O has induced infringement and continues to induce infringement, either literally or under the doctrine of equivalents, of one or more claims of the '446 Patent by distributing, facilitating, directing, and encouraging H2O's users to download, install, and use H2O with AutoML. H2O's activities constitute induced infringement under 35 U.S.C. § 271(b). H2O induces its users to infringe the claim elements of Claims 1, 14, 17, and 23 of the '446 Patent, as outlined in the claim chart attached as Exhibit B, by providing tutorials and trainings for using H2O with AutoML; by providing detailed documentation for downloading, installing, and using H2O with AutoML; and by providing customer support services to directly assist users in downloading, installing, and using H2O with AutoML.

44. On information and belief, H2O's induced infringement of the '446 Patent has been and continues to be intentional, willful, and without regard to PPI's rights. PPI is informed and believes, and on that basis alleges, that H2O's induced infringement of the '446 Patent is and has been intentional, deliberate, and willful because it had knowledge of the '446 Patent through, if nothing more, direct communication with PPI.

45. PPI has sustained damages as a direct and proximate result of H2O's induced infringement of the '446 Patent.

46. PPI will suffer and is suffering irreparable harm from H2O's induced infringement of the '446 Patent. PPI has no adequate remedy at law and is entitled to an injunction against H2O's continuing induced infringement of the '446 Patent. Unless enjoined, H2O will continue its infringing conduct.

**PRAYER FOR RELIEF**

WHEREFORE, PPI prays for relief as follows:

- A. A judgment that the '446 Patent is valid and enforceable;
- B. A judgment that H2O has infringed one or more claims of the '446 Patent;
- C. An order and judgment preliminarily and permanently enjoining H2O and its officers, directors, agents, servants, employees, affiliates, and all others acting in privity or in concert with them, from further acts of infringement of the '446 Patent;
- D. A judgment awarding PPI all damages adequate to compensate for H2O's infringement of the '446 Patent, and in no event less than a reasonable royalty for H2O's infringement, including all pre-judgment and post-judgment interest at the maximum rate permitted by law;
- E. A judgment awarding PPI all damages, including treble damages, based on any infringement found to be willful, pursuant to 35 U.S.C. § 284, together with pre-judgment interest;
- F. Actual damages suffered by PPI as a result of H2O's unlawful conduct, in an amount to be proven at trial, as well as pre-judgment interest as authorized by law;
- G. A judgment that this is an exceptional case and an award to PPI of its costs and reasonable attorneys' fees incurred in this action as provided by 35 U.S.C. § 285; and
- H. Such other relief as this Court deems just and proper.

**JURY DEMAND**

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, PPI hereby demands trial by jury on all issues triable.

Dated: May 26, 2017

**KUNZLER LAW GROUP, P.C.**

By: 

R. Jeremy Adamson  
Attorneys for PUREPREDICTIVE, INC.